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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,336	05/24/2006	Shun Takahashi	ITO-105-PCT	5569
77464	7590	10/23/2009	EXAMINER	
IPUSA, P.L.L.C 1054 31ST STREET, N.W. Suite 400 Washington, DC 20007			NERANGIS, VICKEY MARIE	
			ART UNIT	PAPER NUMBER
			1796	
			NOTIFICATION DATE	DELIVERY MODE
			10/23/2009	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPUSA@IPUSAPAT.COM  
uspa-weeks@ipusapat.com  
ips@itohpat.co.jp

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,336	<b>Applicant(s)</b> TAKAHASHI ET AL.	
	<b>Examiner</b> Vickey Nerangis	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 21-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Please note that the examiner has been changed. The new examiner is Vickey Nerangis.

#### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/7/2009 has been entered.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.
4. All outstanding rejections are withdrawn in light of applicant's amendment filed on 8/7/2009.

#### ***Claim Rejections - 35 USC § 103***

5. Claims 21-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mohanty (US 2003/0216496) in view of Maxfield (WO 93/11190).

Mohanty discloses a polylactic acid-based nanocomposite (paragraph 0059) that is prepared by extrusion and compression molding (see figures 1-4) comprising PLA (paragraph 0023) and clay which is organic modified into an organoclay and dispersed into the polymer (paragraph 0061). Mohanty also teaches the use of a coupling agent to improve the clay-polymer matrix adhesion (paragraph 0061).

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Mohanty fails to disclose an organoclay (i.e., organically modified layered silicate) that is functionalized with a silyl group.

Maxfield discloses polymer nanocomposite that contain exfoliated layered material derivatized with reactive organosilanes, wherein the organosilanes are represented by formula on page 11, line 34. Note page 12, lines 30-34 and page 43, line 20 to page 45, line 2 which include, *inter alia*, epoxyethylene, amine, and ester and amide groups attached to aliphatic substituent. Maxfield teaches that nanocomposite formed from silane swelling/compatibilizing agents provide for improved combination of modulus, tensile strength, and ultimate elongation (page 32, lines 5-8).

Given that Mohanty discloses the use of a coupling agent and further given that Maxfield teaches that coupling agents like presently claimed provide for improved combination of properties, it would have been obvious to one of ordinary skill in the art to utilize the silane swelling/compatibilizing agents of Maxfield in the nanocomposite of Mohanty.

### ***Double Patenting***

6. Claims 21-30 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 3 of copending Application No. 11/628,625 (published as US 2008/0069993). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the reasons given below.

US appl. '625 claims a biodegradable gas barrier container comprising polylactic acid and a phyllosilicate to which a substituted silyl group having a substituted or unsubstituted alkyl group is bonded. On pages 9-10 of the specification of US appl. '625, the substituted silyl group

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is described as, *inter alia*, epoxyethyloxy group and an alkyl group with an N-oxymethyleneamino group. Case law holds that those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. *In re Vogel*, 422 F.2d 438, 164 USPQ 619,622 (CCPA 1970). Therefore, it would have been obvious to one of ordinary skill in the art to prepare a resin composition like claimed with a silicate comprising a substituted silyl group like claimed.

### ***Response to Arguments***

7. Applicant's arguments filed 8/7/2009 have been fully considered but they are not persuasive. Specifically, applicant argues (A) that Maxfield fails to disclose substituents like claimed that are bonded to silicon atom of the substituted silyl group as in claim 21; (B) that Maxfield fails to disclose an alkyl group substituted with substituents like claimed in claim 26; and (C) that the former examiner's statements regarding "coupling agents" and "onium compound" appear to be incorrect.

With respect to argument (A), as illustration, applicant's attention is drawn to page 12, line 14 of Maxfield which discloses a silyl group with amino functional groups. While the amino group is not necessarily bonded directly to the silicon atom, such is not recited in the claim.

With respect to argument (B), on page 44, lines 1-10, note amide and ester groups which are representative of  $Z^1$ .

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With respect to argument (C), the current examiner agrees with applicant regarding the statements by the former examiner about “coupling agents” and “onium compound” as being incorrect.

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vickey Nerangis whose telephone number is (571) 272-2701.

The examiner can normally be reached on Monday - Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

vn

/Vickey Nerangis/  
Primary Examiner, Art Unit 1796